Aircraft Halon Replacement Collaboration

Sponsored by
ICCAIA Cargo Compartment Halon Replacement Working Group
Engine/APU Halon Replacement Industry Consortium
Boeing

December 3, 2013
Philadelphia, PA, USA

Aircraft Halon Replacement Collaboration

3rd December 2013

OBJECTIVE:

. . . To increase commitment on industry collaboration for aircraft halon replacement

AGENDA:

6:00 pm Refreshments

6:30 pm Introductions

6:45 pm Current Status

- Engine/APU Halon Alternatives Industry Research Consortium (IC) – Alan Macias
- Cargo Compartment Halon Replacement Working Group – Rolf Greiner

7:15 pm Common Goals & Opportunities Discussion

- 2014 and On Deliverables
- Synergy Opportunities
- Next Steps

7:45 pm BREAK

Working Sessions

8:00 pm CCHRWG Requirements Document – Doug Ferguson

9:00 pm Engine/APU IC – Alan Macias

10:00 pm Adjourn

Concurrence Needed

INTERNATIONAL COORDINATING COUNCIL OF AEROSPACE INDUSTRIES
CARGO COMPARTMENT HALON REPLACEMENT WORKING GROUP

SUMMARY OF DISCUSSION GUIDELINES
ANTITRUST POLICY & INTELLECTUAL PROPERTY (IP)

While in the process of complying with the ToRs of the International Coordinating Council of Aerospace Industries Associations (ICCAIA) Cargo Compartment Halon Replacement Working Group (CCHRWG), all meetings are to be conducted with basic rules of discussion relative to antitrust policy and intellectual property (IP) protection.

Due to the fact that antitrust and IP rules formalized by ICCAIA member associations and involved industries organizations differ in the level of details, CCHRWG members remain responsible to coordinate with their organization the scope of information they are able to share. With regard to transparency and progress of work, CCHRWG members are requested to clearly indicate cases when they are not authorized to share a specific input or information. To avoid any blockage in technical discussions, those CCHRWG members are requested to help identifying ways forward.

In any case, topics of discussion or agreement which must be avoided at CCHRWG meetings include:

1. Agreements or understandings as to prices, range of prices, pricing methods, margins, possible changes in prices, pricing stabilization, warranties, cash discounts and credit terms.

2. Agreements or understandings to limit product levels, production quotas and limits on sales or supply levels.

3. Agreements or understandings to prevent a person from gaining access to a market or to a customer, or agreements to allocate markets or customers.

4. Agreements or understandings to prevent or boycott any person from obtaining a supply of goods or services freely in the marketplace.

5. In general, any discussions or actions which would tend to restrict competition between members or competitors, within the industry generally.

6. Members must exercise their independent business judgment in pricing their services or products, dealing with their customers and suppliers and choosing markets in which they will compete.

7. Sharing of IP between the CCHRWG participants.

Informal or social discussions outside of, but associated, with CCHRWG meetings should follow the same guidelines above.

Engine/APU Halon Replacement Industry Consortium (IC)

December 5, 2013
The Seventh Triennial International Fire & Cabin Safety Research Conference
Philadelphia, PA, USA

By
Alan Macias (Boeing – BCA)

Industry is leading a broad stakeholder approach

The IC will . . .

- Define a common non-halon fire extinguishing solution for use in engine/APU fire zones that…
  - is compliant to basic industry and regulatory requirements
  - meets multiple OEM (airframe, engine, APU, nacelle, etc.) requirements
  - meets multiple governmental agency regulatory requirements;
  - provides a viable business solution for Consortium partners; and
  - is production-ready
- Engage…
  - Primary Stakeholders = Airframer OEMs
  - Members = Firex Agents/System Suppliers, Airlines, engine companies, nacelle suppliers, airworthiness authorities, etc.
  - A focal point, facilitator & fiscal/contracting “Managing Entity” (ME)
    - Boeing activities facilitating IC initiation will be turned over to the ME
- Execute to a plan…
  - Phase I – initial engagement, confirm interest, launch IC, engage ME, business agreements
  - Phase II – develop technical statement of work (requirements, performance validation, down selection criteria, etc.)
  - Phase III – execute activities required to produce the solution

The IC is progressing as planned

- Phase I
  - Stakeholder engagement growing since July 2013 Kick-off Telecon
    - 4 additional teleconferences have been held to develop high level planning, working methods agreements; telecons to continue every 4 weeks or so
  - Requests for Information sent to ME candidates
    - Responses under evaluation by the IC
    - ME selection late 2013 or early 2014
  - First Face-to-Face Meeting this week (Philadelphia, December 3rd)
    - IC-specific issues, information exchange with CCHRWG on common/similar tasks
  - ECD completion by mid-end 2014
  - Continue ongoing stakeholder outreach and engagement
- Phase II & III
  - Dependent on Phase I completion; ECDs are TBD

- 2013 ICAO Assembly recognized IC commitment (link)

IC Proposal Details & Interim Contacts

IC Proposal Presentation Venues

- IASFPWG Meeting, Cologne, Germany, May 22-23, 2013
  - https://www.fire.tc.faa.gov/pdf/systems/May13Meeting/BennettMacias-0513-ICInterestEgineAPU.pdf
- Halon Alternatives Research Corporation (HARC) sponsored Aviation Stakeholder's Meeting Chicago, Illinois, U.S.A., 11 June, 2013

Contacts:

- Technical: Alan Macias (alan.o.macias@boeing.com)
- ME Engagement: Jean Kiendl (jean.m.kiendl@boeing.com)

Thank you!

Cargo Compartment Halon Replacement Working Group Update

December 5, 2013
The Seventh Triennial International Fire & Cabin Safety Research Conference
Philadelphia, PA, USA

By
Rolf Greiner (Airbus-ASD), CCHRWG Co-chair

Industry is leading a broad stakeholder approach

The ICCAIA Cargo Compartment Halon working group will . . .

- Develop an industry recommendation to ICAO for a cargo compartment halon replacement deadline for new design (new aircraft types); and,
- Conduct the following work plan and schedule
  - Collect & document requirements for cargo compartment halon replacements (ECD Dec 2013)
  - Map requirements into a flow diagram (ECD June 2014)
  - Develop Action Plan with schedule (ECD Dec 2014)
  - Kick-off Action Plan (ECD May 2015)
  - Provide the recommendation for the 2016 General Assembly (ECD Dec 2015)
- Include core members from 6 ICCAIA member associations:
  - AIA, AIAB, AIAC, ASD, SJAC, UAI
- Engage all necessary stakeholders, including
  - Fire protection system and extinguishing agent manufacturers
  - Airline, cargo, general and business aviation aircraft operators
  - Academia and Research Institutions
  - Authorities as advisors on regulatory and certification issues

The CCHRWG is progressing as planned

- 2013 ICAO Assembly recognized CCHRWG commitment (link)
  - ICCAIA representative in Montreal is interface to ICAO
- Stakeholder engagement is growing since the May 2013 Kick-off Meeting
  - 14 Core Working Group (CoreWG) teleconferences have been held
  - 3 Expanded WG teleconferences have been held
    - With an additional 13 participants from 10 organizations
  - 2 Face-to-Face Meetings held
    - Special Core WG Meeting in Cologne in September
    - Expanded WG Meeting in Philadelphia on December 3rd
  - Information exchange with Engine/APU Halon Replacement Industry Consortium
- Deliverables are in-work
  - Specialist Subgroup formed to draft a requirements document reviewed by the Expanded WG
  - Final version expected by end of 2013

Requirement	CFR (@ Amdt 25-136) & AC	CFR Wording	EASA/CFR wording Differences?	EASA Requirements CS (@ Amdt 13) & AMC	CS Wording	Issue paper Special condition	Certification Review item	Potential Means of Compliance	Installation Requirements / Objectives
	25.851(b)	(b) Built-in fire extinguishers. If a built-in fire extinguisher is provided—	same	25.851(b)	(b) Built-in fire extinguishers. If a built-in fire extinguisher is			AMC CS25 Book 2 25.851(b); AC 25-22?	
		(1) Each built-in fire extinguishing system must be installed so that—			(1) Each built-in fire extinguishing system must be installed so that—				
Extinguishing agent likely to enter occupied compartments must not be hazardous to the occupants		(i) No extinguishing agent likely to enter personnel compartments will be hazardous to the occupants; and			(i) No extinguishing agent likely to enter personnel compartments will be hazardous to the occupants; and				
Use of the system must not cause structural damage		(ii) No discharge of the extinguisher can cause structural damage.			(ii) No discharge of the extinguisher can cause structural damage.			The integrity of the Lower Deck Cargo Compartment (LDCC) shall not be endangered by pressure peaks coming from the FSS	Address corrosiveness of agent.
(2) The capacity of each required built-in fire extinguishing system must be adequate for any fire likely to occur in the compartment where used, considering the volume of the		(2) The capacity of each required built-in fire extinguishing system must be adequate for any fire likely to occur in the compartment where used, considering the volume of the compartment and the ventilation rate.			(2) The capacity of each required built-in fire extinguishing system must be adequate for any fire likely to occur in the compartment where used, considering the volume of the compartment and the	FAA Transport Airplanes Issues List (TAIL) - Halon replacement requires an Issue Paper detailing the	AMC identifies need for a CRI; Requires an additional 15 minutes past ETOPS limit;Requires alternative agents meet MPS requirements;	The fire suppression has to be effective until safe landing . AMC addresses means to measure concentration	
							AMC: Compliance testing will require the use of point concentration data from each sensor and that he probes closest to the cargo compartment ceiling must be at least at the highest level that cargo and baggage can be loaded as specified by the manufacturer and certified by the appropriate	The system shall fulfil extinguishing or at least suppression at any point inside the LDCC, where load could be stored	

The requirements drive the 2014 work statement

- Map requirements into a flow diagram (ECD June 2014)
  - Investigate and evaluate options to harmonize requirements across stakeholders
  - Determine dependencies and sequence between requirements
  - Estimate time needed to meet each requirement
  - Identify complete list of current and potential agents noting pros/cons
- Develop Action Plan with schedule (ECD Dec 2014)
  - Incorporate non-proprietary research on halon replacements into plan, and/or
  - Explore options to cooperate with regard to identifying promising design approaches and/or extinguishing agents
  - Note potential schedule risks and opportunities that have been identified, and their implications to the overall schedule
- Continue ongoing stakeholder outreach and engagement
  - Contact:

Rolf Greiner (ROLF.GREINER@airbus.com), Robin Bennett (robin.g.bennett@boeing.com)

Thank you!

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CCHRWG Deliverables

International Coordinating Council of Aerospace Industries Associations

Roadmap to Action

Collect & document requirements for cargo compartment halon replacements (ECD Dec 2013)

- Agent (US EPA SNAP, material compatibility, commercialization)
- System (Concentration, distribution, duration)
- Component (Temperature, vibration, electrical, software, reliability)
- Regulatory (MPS, FARs, ACs, standards)
- Certification (Component qualifications, system test demonstrations, flight test)
- Maintenance (dispatch reliability, lifecycle/duration of parts, repair procedures)

Map requirements into a flow diagram (ECD June 2014)

- Investigate and evaluate options to harmonize requirements across stakeholders
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- Identify complete list of current and potential agents noting pros/cons

Develop Action Plan with schedule (ECD Dec 2014)

- Incorporate non-proprietary research on halon replacements into plan, and/or
- Explore options to cooperate with regard to identifying promising design approaches and/or extinguishing agents
- Note potential schedule risks and opportunities that have been identified, and their implications to the overall schedule

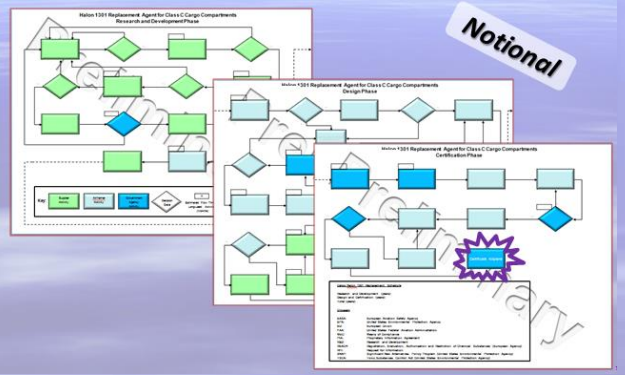
Obtain commitment to support Action Plan from relevant stakeholders

- Kick-off Action Plan (ECD May 2015)
- Recommend a deadline for cargo compartment halon replacements for consideration during 2016 General Assembly (ECD Dec 2015)

International Coordinating Council of Aerospace Industries Associations

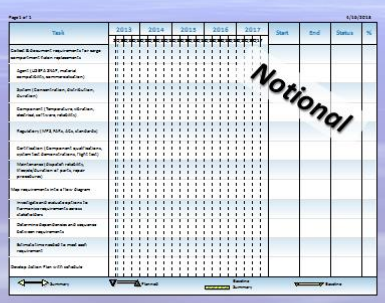
The flow diagram is a roadmap. . .

EXAMPLE:



International Coordinating Council of Aerospace Industries Associations

The roadmap leads to a plan of action . . .



. . . with full cooperation of all stakeholders

Engine/APU Industry Consortium Deliverables

The IC is progressing as planned

- Phase I
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Consortium Activities - Phased Timeline

- Phase II - Technical Statement of Work
  - Development of and agreement on…
    - Agent/System Design & Validation Requirements
    - Define candidate agent/system evaluation plans down selection criteria
    - Etc.
  - Consortium Member Process Check - Final agreement to proceed with Consortium
- Phase III – Primary Deliverable Development/Validation
  - All activities required to produce the Primary Deliverable
    - Identification of potential candidate agents/systems
    - Solicitation of proposals from suppliers
    - Evaluation of proposals against Agent/System Design & Validation Requirements
    - Down selection to go-forward agent/system candidate(s)
    - Detail evaluation (as needed)
      - Testing & analysis
    - Final down selection to common agent/system candidate (as needed)
    - Follow-on evaluation (as needed)
      - Testing & analysis
    - Final agreement by members on Primary Deliverable
    - Documentation finalization
      - MPSHRe test results
      - Generic qualification (test plan, qualification test report)?
      - Toxicology test results
      - SNAP approval
      - Other?
  - Propose completion by end 2015 (tentative)

Common Goals & Opportunities Discussion

- **Synergy Opportunities**
  - Requirements, objectives & goals are similar
  - Logistical efficiencies to be gained
  - Progress needs to be made
- **Next Steps**

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